

# OBSERVATIONS OF NECTAR FEEDING BY CARNABY'S COCKATOO *CALYPTORHYNCHUS LATIROSTRIS*.

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## INTRODUCTION

There are few records of feeding behaviour of Carnaby's Cockatoo *Calyptorhynchus latirostris*, and fewer concerning nectar feeding. Robinson (1960) stated that White-tailed Black cockatoos consumed large quantities of marri nectar and blossom. Serventy and Whittell (1976) stated that White-tailed Black cockatoos consumed large quantities of nectar when gums were in flower and de Reberia and de Reberia (1977) recorded White-tailed Black cockatoos feeding on flowers of *Dryandra* sp. in sandplain country north of Wongan Hills.

None of these feeding records describes the feeding methods in detail nor provides any information on the quantity and quality of the nectar source. This paper describes the feeding behaviour of Carnaby's Cockatoo in gathering nectar from the flower spikes of *Callistemon viminalis* and provides measurements of the quality and quantity of nectar available.

## SITE DESCRIPTION

The observations were made in the gardens surrounding buildings at

the Agriculture Protection Board's Forrestfield complex during a seven-day period from 22nd to 29th October, 1993. During this time approximately 30 cockatoos were present and fed on a range of foods in addition to the nectar from *C. viminalis*. The cockatoos also fed on the seeds from *Banksia attenuata* and the seeds and flowers of *Lambertia multiflora*. The birds were also observed searching for insect larvae in the stems of flowers and fruits of *B. attenuata*. None of the cockatoos were observed feeding on marri *Eucalyptus calophylla* nuts, even though Red-capped Parrots *Purpureicephalus spurius* fed on them during that time.

There are ten mature *C. viminalis* bushes in the gardens at this site ranging in size from 2 m tall and 1.5 m in diameter to nearly 6 m tall and nearly 6 m in diameter.

## METHODS

Observations of the feeding behaviour of the cockatoos were made opportunistically. The birds could be approached to within 5 m on foot and as close as 1-2 m by vehicle.

The data on the nectar were recorded on the 30th October, at the end of the feeding association. However, a few birds were still present when the data were collected and two were feeding on the nectar while the data were collected. The measurements were made between 1100 and 1230 Hrs, times when the cockatoos were regularly seen feeding on the nectar. The nectar quality was measured by collecting samples from individual flowers on spikes which were fully open and showing no signs of damage or withering. Nectar was collected in Vitrex micro haematocrit tubes and then transferred to a Brix 0-50% Sucrose, hand-held refractometer and the sucrose concentration read immediately. Measurements were taken from five flowers per spike, on each of five spikes selected from five different *C. viminalis* bushes.

The volume of nectar available from each flower spike was determined by placing a spike into a 100 ml plastic vial and fitting the lid. The vial was then placed in to a calico bag which was spun at speed for 30 revolutions. The flower spike was then removed and the nectar which had been extracted was drawn up in a 1.0 ml graduated syringe and the volume read to the nearest 0.02 ml.

It is not possible to determine whether all the flower spikes that were pruned from the *C. viminalis* bushes had been fed from or that Carnaby's Cockatoos were the only birds involved. However, by counting the number of spikes on the ground beneath the bushes and the number remaining on the plants it is possible to estimate the

maximum percentage of flower spikes removed by the cockatoos and the maximum volume of nectar potentially available to them.

## RESULTS

### Feeding Behaviour

If a flower spike was easily accessible the cockatoo simply opened its beak and pushed its tongue into each flower, without actually grasping the spike in its bill. Using this technique only those flowers on the dorsal surface of the spike could be probed. When the flower spike was not easily accessible the cockatoo cut the spike free with its bill and then transferred it to one of its feet. Once the spike was securely held the bird proceeded to probe the flowers. In order to get at the remaining flowers the cockatoo would grasp the spike with its bill while it loosened its foothold and turned the spike about a quarter of a revolution. Then the spike was re-grasped with the foot and the bird proceeded to probe the newly exposed flowers. This procedure was repeated until all of the flowers had been probed. Once the spike had been discarded the cockatoo ran its tongue around the inside of its bill, presumably to collect any remaining nectar in its bill.

The flower spikes were selected one at a time and there was very little wastage. The birds also appeared to only select fully opened spikes, ignoring those which were unopened or had already undergone anthesis.

Table 1. Nectar quality (% sucrose) recorded from *C. viminalis* flowers.

| Spike No. | Avg. % Sucrose | s.d. | N |
|-----------|----------------|------|---|
| 1         | 19.4           | 2.9  | 5 |
| 2         | 18.9           | 2.9  | 5 |
| 3         | 23.3           | 3.6  | 5 |
| 4         | 12.7           | 5.6  | 5 |
| 5         | 18             | 2.7  | 5 |

### Nectar Quality and Quantity

The mean sucrose concentration of the nectar was 18.5% (Table 1), with a range of 4.0%-28.0%. The volume of nectar recovered from the flower spikes ranged from 0.22 ml to 0.64 ml with a mean of 0.47 ml (s.d.=0.15, N=10). The flower spikes which were pruned from the bushes represented a large percentage of the crop ranging from 32.2%-76.5%, and with a mean of 52.2% (Table 2).

Assuming that all of the spikes pruned from the bushes were in full flower and that the cockatoos were the only species which fed on them, the maximum volume of nectar available was nearly 2.84 litres.

### DISCUSSION

The *C. viminalis* bushes at this site normally flower well, but appear to have had an exceptional year in 1993. In past years Australian Ravens *Corvus coronoides* have been observed feeding on the nectar supply but not in such a concentrated manner over such a short period. Carnaby's Cockatoos are regular visitors to this site (Mawson and Massam 1995), but have not been observed feeding on the *C. viminalis* before.

Based on the measurements made here it is clear that the *C. viminalis* provided a very rich source of food. Nectar of this concentration and in this quantity must provide a valuable carbohydrate source. The ease with which it was collected suggests that Carnaby's Cockatoo is well adapted to feed on nectar even though it does not have a brush-tongue like members of the Loriidae.

One important feature of the feeding style of these cockatoos is that it is destructive and prevents any other species from visiting the flower spikes at a later time to gather nectar. In addition to the Australian Ravens four other

Table 2. Estimated number of flower spikes and percentage of total crop removed by cockatoos.

| Plant No. | Spikes Removed | Spikes Remaining | % Total Removed | Plant Size (Ht x Diam.) in m |
|-----------|----------------|------------------|-----------------|------------------------------|
| 1         | 1068           | 328              | 76.5            | 4 x 4                        |
| 2         | 844            | 620              | 57.6            | 4 x 4                        |
| 3         | 1520           | 1404             | 51.9            | 6 x 4                        |
| 4         | 1408           | 2960             | 32.2            | 5 x 6                        |
| 5         | 1200           | 1600             | 42.8            | 6 x 6                        |

species of bird were recorded feeding on the nectar during the period of observation; Brown Honeyeater *Lichmera indistincta*, Singing Honeyeater *Meliphaga virescens*, Red Wattlebird *Anthochaera carunculata* and Red-capped Parrot *Purpureicephalus spurius*.

The cockatoos removed the greatest proportion of flower spikes from the smaller bushes because they had a more open habit and allowed the birds access to a greater number of spikes. On some of these smaller bushes the only spikes not removed were those which were located at the ends of very thin branchlets. On the larger bushes a greater proportion of spikes were left because many were located amongst dense clumps of branchlets which prevented the cockatoos from reaching in and picking the flower spikes.

Observations of other *C. viminalis* bushes located in gardens in the surrounding suburb indicated that none were used by the cockatoos. This suggests that the more secluded location and the close proximity of large trees suitable for roosting made the site so attractive. Saunders (1979) noted Carnaby's Cockatoos seemed to favour areas where they could sit in trees when not feeding, then fly down to feed, returning to the trees after feeding. The lack of large trees near *C. viminalis* bushes in suburban gardens may have made these potential food sources unsuitable.

Having discovered such a rich food source it will be interesting to see whether the cockatoos return next

year or whether this was a once-off event due to the super abundance of flowers and nectar. If nothing else the *C. viminalis* bushes have been well pruned, a requirement for good flowering next year, as the flowers only form on new growth.

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